Bloedafbraak bij pasgeborenen

Engelhardt, Jan

SUMMARY.

After a survey of the literature concerning the hemolysis in new-born children and a general dissertation on intravital hemolysis an account is given of the experiments of the author.

The theory of Fåhraeus, who described how intravital hemolysis is brought about by lysolecithin, a substance formed in stagnating blood from lecithin by the fermentative splitting off of one molecule of unsaturated fatty acid, is taken as a starting point.

This substance lysolecithin can be manufactured from serum in a simple way and is able up to high dilutions to solve erythrocytes in vitro.

Fåhraeus ascribes an important part to the spleen in the formation of lysolecithin, as the blood can stagnate in this organ for a few hours, and the possibility for the formation of lysolecithin is thus given.

We have repeated the experiments of Fåhraeus in vitro and have been able to determine that: lysolecithin can be made from adults' sera, after incubation, in nearly constant quantitities;

lysolecithin loses its activity by the influence of free cholesterol;

hemolysis by lysolecithin is checked by small quantities of diluted serum, in which case the cholesterol-content of this serum is the most important inhibiting factor.

The osmotic resistance of erythrocytes is diminished after a contact of these cells with lysolecithin.

After this orientating research the same experiments were repeated with the blood of new-born children. From the results obtained, it appeared that:

from serum of the umbilical cord, after incubation, a greater quantity of lysolecithin can be made than from adults serum;

the small cholesterol content of the cord-blood must be held responsible for this fact, while the possibility was suggested that the new-born child may have a greater lecithinase-content in the blood;

estron checks the splitting of lecithin;

serum of a new-born child inhibits the lysolecithinic hemolysis to a less extent than adults' serum does.

In a number of new-born children serial determinations were carried out of the hemoglobin-content, cholesterol-content and bilirubin-content during the first days of life.

In the blood of the umbilical cord there appeared to run an obvious parallel between the lipoid-concentration $\frac{\text{lecithin}}{\text{free cholesterol}}$ and the bilirubin-content.

This connection remained demonstrable on the 2nd, 4th, 6th and 9th day of life.

In a series of new-born children, injected with 30.000 U. Menformon on the first day, this connection between the lipoïds and the bilirubin could not be found again, while also the course of the bilirubin-content deviated from that of new-born children not having undergone treatment.

On the ground of these results the following theory was framed as an explanation of the postnatal hemolysis.

At birth a hemolysis exists, of which the intensity is dominated by the lecithinase-content, the proportion of the lipoids, $\frac{\text{lecithin}}{\text{free cholesterol}}$, and by the estron.

The excretion of the estron during the first days increases the formation of lysolecithin, which increase can be compensated by the regularly rising cholesterol-content. The proportion between the excretion of the estron and the rapidity of the rising of the cholesterol-content, determine the intensity of the postnatal hemolysis.

The disappearance of the oestron from the organism is also important in new-born children for the decrease of hematopoietic activity, as was shown in the series of new-born children treated with estron.